Connecticut NASA Space Grant College Consortium
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GFY 08 Progress Report

PROGRAM DESCRIPTION

The National Space Grant College and Fellowship Program consists of 52 state-based, university-led Space Grant Consortia in each of the 50 states plus the District of Columbia and the Commonwealth of Puerto Rico. Annually, each consortium receives funds to develop and implement student fellowships and scholarships programs; interdisciplinary space-related research infrastructure, education, and public service programs; and cooperative initiatives with industry, research laboratories, and state, local, and other governments. Space Grant operates at the intersection of NASA's interest as implemented by alignment with the Mission Directorates and the state's interests. Although it is primarily a higher education program, Space Grant programs encompass the entire length of the education pipeline, including elementary/secondary and informal education. The Connecticut Consortium is a Capability Enhancement Consortium funded at a level of **$541,000** for government fiscal year 2008. Due to the off-cycle nature of the Connecticut Consortium the following report details programs implemented between September 2008 – June 2009 which were funded by GFY 2007 funds. Our Consortium received GFY 2008 funds in May 2009 and while we have begun implementing programs and providing grant awards, in an effort to align our Consortium with the reporting timeline of the rest of the national network, we are providing a full report of activity from last academic year (fall 2008 – spring 2009 – GFY07 funds) as well as a status report for programming and award activity in progress now (fall 2009 – spring 2010 – GFY08 funds). Therefore, attached are Excel spreadsheets for both GFY07 and GFY08 reporting. Of note, the demonstrated improvements under longitudinal tracking section below which demonstrate a 7.41% improvement in awarding to underrepresented students (exceeding our Consortium's goal for 09-10 to date), and an 8.8% increase in awarding to female students over last year.

PROGRAM GOALS

The mission of the Connecticut Space Grant (CTSG) College Consortium is to further the efforts started through NASA's Education Strategic Framework. The Education group has begun initiatives with three major outcomes:

1. Development of the STEM workforce in disciplines useful to NASA,
2. Attraction and retention of students in STEM disciplines,
3. Partnerships which promote STEM literacy and awareness of NASA's mission.

The CTSG Consortium will continue to contribute to the success of all three outcomes listed above, albeit with different programs, levels of effort and resources. Variations in resource allocation and the fundamental makeup of consortia (designated state vs. non-designated state) will naturally allow some of these outcomes to be more emphasized and consequently more strongly supported. However, our goal is to produce results that strengthen each outcome.

The CTSG Consortium presently has membership which includes higher education institutions along with aerospace companies and informal educators. Our past funding decisions and future plans demonstrate our commitment to Outcome 1, development of a STEM workforce. We plan to effectively leverage our financial resources with the efforts of a wide

range of groups that have complementary interests in our state. Our broad-based efforts in support of Outcome 1 will be continued through an UG and graduate student fellowship program, in which students work on projects related to NASA's mission. STEM workforce development efforts will be continued and expanded by extramural programs involving other state Consortia (Summer 2009 UTC internship will be expanded for summer 2010). We have firm commitments from numerous local aerospace companies to accept student interns (e.g. Pratt & Whitney, Hamilton Sundstrand, etc.). Our consortium has just begun to tap the potential available from numerous smaller aerospace supply companies within our border. These companies also provide internship opportunities as well as varied projects for our students.

The CTSG Consortium will continue our existing ties with elementary and secondary education groups in order to strengthen the ability of our consortium to influence Outcome 2, attraction and retention of students in STEM fields. These groups include state-wide science groups, as well as magnet schools. These magnet schools have seen significant growth in student enrollment over the last decade. A number of magnet schools focus on STEM fields and we plan to align with them since we believe in the importance of supporting creative and innovative programs that reflect our strategic interests. The goal is for our activities to influence students to pursue STEM fields in college. By concentrating on magnet schools, which boast a diverse student population, we hope to increase the diversity of the student population within STEM fields in colleges. We have reached out to individual schools throughout the state (magnet high school and primary school in New London, middle schools in Hartford), and the University High School of Science and Engineering located on the campus of the lead institution.

Finally, we will bolster existing community links within the informal education field (eg. museums and science centers) and seek new partnerships in order to impact Outcome 3, promotion of STEM literacy. Community involvement links include our longstanding affiliation with the New England Air Museum (NEAM), as well as an opportunity to leverage efforts with the CT Science Center which hosted the CTSG Consortium Spring Seminar. As Connecticut is a small state this science center is within 25 miles of most consortium members.

PROGRAM/PROJECT BENEFIT TO OUTCOME (1,2, OR 3)

Outcome 1 STEM Workforce Development

Connecticut initiated the UTC Summer Aerospace Internship program during 2009. This program created internship opportunities for Rhode Island and Puerto Rico Space Grant UG students during the summer of 2009 within several UTC aerospace divisions. Due to coordination difficulties within our collaborating consortia partners only Rhode Island students joined CT students in work at Connecticut companies during 2009, but the opportunity will be expanded during summer of 2010, for more consortia and many more students. A total of 11 students (8 Connecticut and 3 Rhode Island (*4 were offered positions, but one declined*) took part during the summer of 2009. Student and company feedback highlight this program as a tremendous success. Students received challenging assignments from their aerospace mentors, and the companies extolled the technical acumen of their student interns. Several interns were invited to stay on as company paid interns during the school year, and we anticipate several job offers arising from these internships.

Outcome 2 Attract and Retain students in STEM disciplines

Our Consortium continued to support the PLAN academy for high school teachers during the 2008-2009 academic year. This program provided training to 9 (3 male/6 female) high school teachers (2 of whom were from underrepresented groups) from 4 public school districts.

PROGRAM ACCOMPLISHMENTS

OUTCOME 1 Development of STEM workforce in disciplines useful to NASA

1. Place at least 4 students into aerospace internship positions (incl. NASA centers)
2. Place students into 3 different aerospace internship sites
3. Award at least 6 undergraduate fellowships in fields useful to NASA
4. Award at least 1 graduate fellowship in a field of use to NASA

Our Consortium met all four of Outcome 1 SMART goals for GFY 2008 funds.

1. Our Consortium placed 11 student interns during the summer of 2009.
2. These students worked at 7 different corporate sites (Sikorsky, Pratt & Whitney, UTCPower, HABCo, KAMAN, CT Invention Convention and UTC Research Center).
3. We awarded 10 UG fellowships in technical fields useful to NASA and 26 UG scholarships through the CT Community Colleges – College of Technologies program to students continuing the pursuit of STEM majors at 4-year affiliate institutions.
4. We awarded 3 graduate fellowships in technical fields useful to NASA

In addition to meeting all four SMART goals, our consortium initiated a UTC internship program that was open to Rhode Island and Puerto Rico students during the summer of 2009. Due to the late start, only RI students participated in this internship program (funded by the RI Space Grant). Connecticut provided challenging internship positions at aerospace firms and found low-cost housing for the students on the campus of the University of Hartford.

OUTCOME 2 Attraction and Retention of Students in STEM disciplines

1. Fund at least 8 MS/HS teachers through PLAN summer academy
2. Quantify HS student selection of STEM fields for higher ed. study within CT

Our consortium met its 1st goal and did not achieve the 2nd goal for the GFY 2008 funding.

1. In conjunction with the CT Center for Advanced Technology we provided a summer academy for 9 High School teachers during the summer of 2009.
2. We did not achieve our second Outcome 2 goal, because we have not found the right administrator within the Connecticut Office of Education. We are still trying to find the office within Connecticut which hosts this information.

OUTCOME 3 Build strategic partnerships that promote STEM literacy and awareness of NASA's mission

1. Formalize linkages within state ed. groups; complete a MOU with at least 1 new group
2. Verify that the new CT Science Center has at least one exhibit related to NASA

Our consortium achieved the second Outcome 3 SMART goal and did not reach the first one.

1. We have not completed a MOU with any state education group. We are re-evaluating this SMART goal. Our focus is on higher education, and we are trying to uncover the benefit to our consortium from completing a MOU with these education groups.
2. We hosted our Spring Affiliate Retreat at the new CT Science Center and verified that a number of exhibits are related to NASA and space science in the CT Science Center.

PROGRAM CONTRIBUTIONS TO PART MEASURES

- Longitudinal Tracking: We continue to emphasize the importance and absolute necessity of Longitudinal Tracking of students and faculty who receive significant Space Grant funding. All of our affiliate campus representatives are required to provide an annual update of the students and faculty from their respective campus who have been awarded grants. This will better enable us to respond to NASA Education's new reporting requirement of including data for all student award recipients.

Awarding from Fall 2008-Spring 2009 - Final Report (GFY07) Student Data and Longitudinal Tracking: Total student awards = 66; Fellowship/Scholarship = 53, Higher Education/Research Infrastructure = 13; 9 (13.64%) of the total awards represents underrepresented minority F/S funding; 22 (33.3%) of these awards were granted to female students. 3 (4.5%) of the total awards were received by graduate students, while 63 (95.4%) were granted to undergraduates. 58 students are currently enrolled in their degree program at this time, 4 have graduated and are seeking STEM employment (2 of these individuals are women), and 2 have graduated and are pursuing graduate studies in STEM now. 1 has graduated and is currently employed within a STEM aerospace contractor.

The student applicant to award ratio achieved for the year was 2.166:1 (*143 applicants to 66 student award recipients*).

Summary of Awarding from Fall 2009 – Present – Progress Report (GFY08) Student Data and Longitudinal Tracking: Total awards = 19; Fellowship/Scholarship = 14, Higher Education/Research Infrastructure = 5; 4 (21.05%) of the total awards represents underrepresented minority F/S funding; 8 (42.1%) of these awards were granted to women. 2 of the total awards were received by graduate students, while 17 (89.5%) were granted to undergraduates. All 19 students are currently enrolled in their degree program at this time.

Note: Because CTSG Consortium lags its peers by one year in its funding, it is only in the 1st half of its grant awarding of GFY08 funds. A 2nd call for proposals is planned for Feb 2010.

The student applicant to award ratio achieved to date is 2.157:1 (*41 app. to 19 recipients*).

Course Development: The CTSG Consortium funded one Curriculum Development grant for a faculty member at Yale University. Karen Seto from Yale's school of Forestry and Environmental Studies was funded to develop a new course in remote sensing that focused on land-cover and land-use change.

Matching Funds: Our consortium uses several techniques to achieve the matching funds required by NASA. The lead institution has allowed the director and associate director to have three course releases each year. This contribution accounts for 50% of their teaching time, producing a 50% salary match. Each affiliate provides 10% of the time for their campus director, also producing match. Each of our faculty research grants requires match funding. Our internship program is also operated with in-kind matching from our Industrial partners.

Minority-Serving Institutions: We have an agreement with the sole minority serving institution in Connecticut, (Capitol Community College) to begin a seminar series for their students on technical topics (at least 2 seminars will be in the aerospace field). These seminar series will seek to engage Capitol students into the Space Grant process. The seminars will run on the Capitol Community College campus along with Trinity, University of Hartford and Central Connecticut State University. Rotating the seminar series among these closely grouped schools (20 minute drive time for the two furthest apart) is designed to give the 2-year COT students comfort and familiarity with the local 4-year affiliates with the ultimate goal of inspiring these students to further their pursuit of STEM studies at a 4-year institution.

IMPROVEMENTS MADE IN THE PAST YEAR

Affiliate Engagement/Satisfaction Our affiliates are much more engaged in the Space Grant effort, definitely replacing the dissatisfaction noted in the 20 year PPR results. We have several campus directors leading key initiatives in our program. Al Gates (CCSU) is the program lead for the Helicopter training program, which kicks off summer 2010. Karen Birch (COT) is the

leader for the Capitol Community College Speaker program (MSI initiative). John Daponte (SCSU) is the program leader for the summer Bridge program. We hosted a spring retreat at the CT Science Center in June 2009 to help our affiliates understand their specific roles. Finally we have regular contact with them through our program coordinator.

National Network Collaboration We have dramatically increased our collaboration with the National Space Grant Network as well as collaborations with individual Space Grant Consortia. Our director is now the Operations Mission Directorate Working Group chair. This group is seeking to find ways to work with NASA's Operations Mission Directorate, similar to the linkages established with the Exploration Systems Mission Directorate (e.g. Senior Design Projects, Curriculum Development, Internships, Projects etc.). The Connecticut Space Grant Consortia has an on-going effort with the North Dakota Space Grant to develop a Space Suit. Finally, our state has offered Industrial internships for Rhode Island and Puerto Rico (summer 2009) which will be extended to other consortia for the summer of 2010.

Minority Serving Institutions We have initiated one program this academic year (09-10) that will directly involve the sole MSI in Connecticut Capital Community College (CCC). We are working with Capital and local affiliates of the Connecticut Space Grant (CCSU, Trinity and University of Hartford) to have greater involvement in the Space Grant activities from CCC students.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

The role of the academic affiliates is to share NASA opportunities with their student body. The following are descriptions of the CT Space Grant Consortium's Academic Affiliates: **Fairfield University** - 4-year Arts $ Sciences University with 4,000 UG & 1,000 grad students. **Wesleyan University** -a 4-year Arts & Sciences University with 2,700 UG& 600 grad students. **Trinity College** -a 4-year Arts and Sciences College, with an undergraduate enrollment of 2,250. **The Connecticut Colleges of Technology** – 2-year science colleges, 2/average enroll. of 13,000 students. **The University of Hartford** is the lead institution for CTSG Consortium; 4-year Arts & Sciences University with 4,600 UG & 1,600 graduate students. **The University of Connecticut** - Tier 1 Res. Univ. w/16,300 UG & 6,400 graduate students. **The University of Connecticut Health Center** (CT's 16th largest employer) composed of the School of Medicine, School of Dental Medicine, John Dempsey Hospital, the UConn Medical Group, UConn Health Partners and University Dentists. 320 medical &160 dentistry students. **The University of Bridgeport** - 4-year Arts & Sciences University w/5,000 UG students. **The University of New Haven** - 4-year Arts & Sciences Univ. w/2,400 UG students. **Eastern Connecticut State University**, **Central Connecticut State University** and **Southern Connecticut State University** - 4-year Schools of Arts & Sciences. Their combined UG enrollment is 21,000 students, with an additional 4,500 students enrolled in graduate programs. **Yale University** a large private, ind. research university w/5,247 UG & 6,169 graduate students.

The role of the Industrial Affiliates is to provide opportunities for consortium students, as well as support work-force development efforts. Following are the CTSG Consortium's Industrial Affiliates: **Pratt & Whitney Aircraft**, **Hamilton Sundstrand**, **Sikorsky Aircraft**, **Kaman**,

The role of the Non-Industrial Affiliates is to support non-traditional educational opportunities. Following are descriptions of the CTSG Consortium's Non-Industrial Affiliates: **Connecticut Center for Advanced Technology**, a non-profit technology support organization. **New England Air Museum**, a non-profit museum housing over 125 aircraft (100 yrs of flight).